Defect function and flat descent

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Let $\mathcal{P}$ be a property of Noetherian rings which is local and ascends and descends by faithfully flat ring homomorphism. A defect functions associated to $\mathcal{P}$ is a numerical function λ from the class of Noetherian local rings to the set of non-negative numbers such that $\lambda(A) = 0$ if and only if A is $\mathcal{P}$. For examples, the difference between dimension and depth and the difference between a cohomological degree and multiplicity are two defect functions associated to the Cohen-Macaulay property. In the first part of the talk, I will discuss the behavior of certain defect functions with respect to flat base change. In the second part, I restrict to those defect functions which behave well with respect to flat homomorphism and discuss its descent through a proper morphism of Noetherian schemes.